PROGRESS REPORT 3

# AUTOMATIC PHOTOINTERPRETATION FOR LAND USE MANAGEMENT IN MINNESOTA

ERTS

Proposal Number MMC 257

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## I. PROGRESS

### Aerial Photographic Data

Photographic products from Mission 205 arrived September 25 from Mission Management Office, Houston. Table I lists the photographic scales and product types.

TABLE I

| Camera | Scale | Transparency Types |
|---|---|---|
| Zeiss 51 (300 mm f.l.) | 1:60,000 | Color Infrared |
| RC8 (150 mm f.l.) | 1:120,000 | Color Positive<br>Color Infrared |
| Hasselblad Cluster (40 mm f.l.) | 1:450,000 | B and W (4 channels)<br>Color Positive |

The flight lines covered are in good agreement with the specified areas, and the image quality is good. The single day coverage provided samples of all nine primary land use categories used by the Minnesota State Planning Agency. (Consultation with the University of Minnesota Department of Geography determined that their manual interpretation of the same coverage started October 13.)

An Optronics Corp. photographic scanner and film writer was recently acquired by our department. This device provided preliminary scans of selected areas of Hasselblad camera coverage, both black and white and color positive. With a 0.1 mm aperture the equivalent ground resolution element is 45 m. A filter wheel permits color measurement data to be taken by repeated runs across specified film areas. The first runs have tested the equipment, determined signal level ranges to be encountered, and permitted an evaluation of the color discrimination between lake water, cultivated fields, small towns, and wooded areas. The overlapping photographic coverage permits comparative measurements of some ground areas in frame subareas both toward and away from the sun. Such areas are useful to determine the dispersion of measured features of land use samples across the full photographic frame.

### ERTS-MSS Products

The first photographic prints and transparencies reconstituded

from multispectral scanner data arrived September 22, and subsequent image frames have been arriving occasionally since. Section three lists six frames for which computer compatible tapes were ordered by telephone October 13. All land use categories except extractive (mines) are represented. Subsequent frames to be ordered include coverage of this category (the Mesabi iron range). Delivery of the first CCT's is expected in early November.

Programming necessary to read and transcribe data from the CCT's was debugged and completed using the previously acquired step-wedge test tapes. Programs necessary to locate specified geographic test sites in the data were also completed taking into account the yaw and skew of the frames.

## II. STANDING ORDER PRODUCTS

The standing order is unchanged.

## III. DATA REQUEST FORM

Listed below are frame identifiers and center coordinates for MMS bulk CCT's ordered by telephone October 13, 1972. Color composite prints and transparencies were requested also, as were black and white versions for the last two entries.

| No. | Observation Identifier | Center Point Coordinates | Minnesota Area | Land Uses Included * |
|---|---|---|---|---|
| 1. | 1025-16533 | N 49-15<br>W 97-10 | N.W. Corner | 2, 4 |
| 2. | 1025-16535 | N 47-57<br>W 97-45 | N.W. edge | 2 |
| 3. | 1041-16421 | N 48-47<br>W 94-35 | N Central Boundary | 1, 2, 3, 4 |
| 4. | 1022-16375 | N 43-46<br>W 95-08 | S.W. Corner | 2 |
| 5. | 1022-16371 | N 46-26<br>W 94-01 | Central | 1, 3 |
| 6. | 1022-16373 | N 45-01<br>W 94-39 | Central | 2, 3 |

* The land use code is:

0 - Clouds
1 - Forested
2 - Cultivated
3 - Water
4 - Marsh
5 - Urban residential
6 - Extractive (mines)
7 - Pasture/Open
8 - Urban non-residential
9 - Transportation

Column five lists only the most widespread land uses characterizing the terrain covered in given frames. Small towns and small bodies of water occur in all frames, and can and will be found in the digital data, but with more effort than required for categories identified above. Clouds occur to some extent in all frames. While they are not a "land use" their inclusion as a classification category is important considering the long range goal of automated data analysis.